

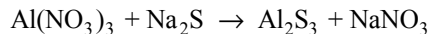
Harder Practice Problems for Chapter 3

Multiple Choice- YOU CANNOT USE A CALCULATOR FOR THESE

1. How many moles of hydrogen sulfide are contained in a 66.0-g sample of this gas?

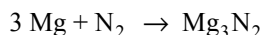
- A) 0.52 mol
- B) 1.94 mol
- C) 100.1 mol
- D) 32.7 mol
- E) 3.87 mol

2) When the following equation is balanced, the coefficients are _____.



- A) 2, 3, 1, 6
- B) 2, 1, 3, 2
- C) 1, 1, 1, 1
- D) 4, 6, 3, 2
- E) 2, 3, 2, 3

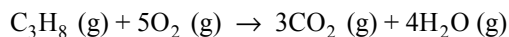
3) Magnesium and nitrogen react in a combination reaction to produce magnesium nitride:



In a particular experiment, a 9.27-g sample of N_2 reacts completely. The mass of Mg consumed is _____ g.

- A) 8.04
- B) 24.1
- C) 16.1
- D) 0.92
- E) 13.9

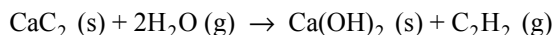
4) The combustion of propane (C_3H_8) produces CO_2 and H_2O :



The reaction of 2.5 mol of O_2 will produce _____ mol of H_2O .

- A) 4.0
- B) 3.0
- C) 2.5
- D) 2.0
- E) 1.0

5) Calcium carbide (CaC_2) reacts with water to produce acetylene (C_2H_2) :



Production of 13g of C_2H_2 requires consumption of _____ g of H_2O .

- A) 4.5
- B) 9.0
- C) 18
- D) 4.8×10^2
- E) 4.8×10^{-2}

6) The formula of nitrobenzene is $C_6H_5NO_2$. The molecular weight of this compound is

_____ amu.

- A) 107.11
- B) 43.03
- C) 109.10
- D) 123.11
- E) 3.06

7) The mass % of H in methane (CH_4) is _____.

- A) 25.13
- B) 4.032
- C) 74.87
- D) 92.26
- E) 7.743

8) One mole of _____ contains the largest number of atoms.

- A) S_8
- B) $C_{10}H_8$
- C) $Al_2(SO_4)_3$
- D) Na_3PO_4
- E) Cl_2

9) How many molecules of CH_4 are in 48.2 g of this compound?

- A) 5.00×10^{24}
- B) 3.00
- C) 2.90×10^{25}
- D) 1.81×10^{24}
- E) 4.00

10) A compound has 1.10 mol of K, 0.55 mol of Te, and 1.65 mol of O. What is the simplest formula for this compound?

- A) KTeO
- B) KTe_2O
- C) K_2TeO_3
- D) K_2TeO_6
- E) K_4TeO_6

Problems-Answer these on a separate sheet of paper.

1. Consider a sample of calcium carbonate in the form of a cube measuring 2.005 in. on each edge. If the sample has a density of 2.71 g/cm^3 , how many oxygen atoms does it contain?

2. If an automobile travels 225 mi with a gas mileage of 20.5 mi/gal, how many kilograms of CO_2 were produced? Assume gasoline is composed only of octane (C_8H_{18}), which has density of 0.69 g/mL.

3. When hydrocarbons are burned in a limited amount of air, both CO and CO_2 form. When 0.450 g of a particular hydrocarbon was burned in air, 0.467 g of CO, 0.733 g of CO_2 , and 0.450 g of H_2O were formed.

- a. What is the empirical formula of the compound?
- b. How many grams of oxygen were used in the reaction?
- c. How many grams of oxygen would have been required for complete combustion?